NASA Procedural Requirements

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NPR 2810.1A
Effective Date: May 16, 2006
Expiration Date: May 16, 2011

Printable Format (PDF)

Request Notification of Change (NASA Only)

Subject: Security of Information Technology

Responsible Office: Office of the Chief Information Officer

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Section II Defining The System

a. Many activities are involved in the design and implementation of an information system. Successful protection of IT resources relies upon program-level IT security requirements and system-level security requirements. Program-level IT security requirements are general in nature and apply to overarching concepts. System-level security requirements are specific management, operational, and technical security controls and processes utilized to certify and accredit a system for processing information.

b. NIST SP 800-64, Security Considerations in the Information System Development Life Cycle, provides additional guidance on the IT security system life cycle and the criticality of including IT security considerations at all stages in the life cycle. The implementation of IT Security (ITS) practices is not a linear process. While there is a general flow from the initiation of an IT system through its life cycle to disposal of the system, several of the critical IT security processes are not linear, but are cyclical or can be repeated in whole or in part throughout the system's life cycle.

Chapter 5 System Development Life Cycle

5.1 System Development Life Cycle Overview

5.1.1 Information and information systems, like programs and projects, have a life cycle. NIST defines the SDLC phases as: (1) initiation, (2) acquisition and development, (3) implementation, (4) operations and maintenance, and (5) disposal.

5.1.2 Information and IT security controls are critical to IT investments and systems being certified and accredited to operate during development testing, proof-of-concept testing and operations, and pilots, as well as operational status. To ensure that the C&A of systems is

successful without affecting schedule, cost, and performance, IT security controls shall be planned for and factored into all decisions during the life cycle processes.

5.1.3 The NPR 7120.5 life cycle and the life cycle documented in NIST SP 800-64, Security Considerations in the Information SDLC, are complementary.

5.2 System Development Life Cycle Requirements

5.2.1 IT security controls shall be planned for and factored into all decisions during the SDLC processes including relevant program and project IT requirements and during the SDLC of any applicable program or project IT resources. IT security must be considered throughout the SDLC, which goes from conception to disposal.

5.2.2 To ensure that IT security is integrated into the SDLC initiation phase and following NPR 7120.5, NASA Program and Project Management Processes and Requirements, all program Formulation Authorization Documents (FADs) shall identify the FIPS 199 information type that IT investments and systems will be processing and handling.

5.2.3 NASA shall avoid impacts to schedule, cost, and performance during the SDLC acquisition and development phases of PCAs by:

a. Designing information systems that comply with Federal laws and NASA IT security requirements.

b. Identifying, by title, the NASA authority authorized to grant exceptions to Federal laws and NASA IT security requirements.

5.2.4 To ensure that the SDLC implementation, operations and maintenance, and disposal phases, including the transition from a development/proof-of-concept to operational status, projects must:

a. Incorporate system security planning, including risk assessment, contingency planning and testing, C&A, and continuous monitoring early in the system formulation and throughout the life cycle of the processes and procedures of NPR 7120.5, NASA Program and Project Management Process and Requirements, which complement the IT security life cycle processes.

b. Identify the category of the information expected to be accessed or created.

c. Specifically assign an ISSO responsible for ensuring the information system complies with Federal and NASA IT security requirements.

d. Include IT security costs.

5.2.5 Figure 5-1 lists the various NIST SDLC phases, project life cycle, and security actions. This figure demonstrates how the same security control process is addressed in multiple life cycle phases. See NPR 7120.5 for NASA's life cycle phases.

System Development Life Cycle (SDLC)	NIST Project Life Cycle	Security Actions
Initiation Phase	Identify Mission Requirements Linkage of need to Mission and Performance Objectives Assessment of Alternatives to Capital Assets Preparing for investment Review and Budgeting Request for Quotation (RFQ) Request for Information (RFI) Request for Proposal (RFP)	Capital Planning Security Boundaries, Categc and System Type Identifi Identification of Master and Subordinate System Plar Preliminary Risk Assessmer
Acquisition/ Development Phase	Functional Statement of Need Market Research Feasibility Study Requirements Analysis Alternative analysis Cost-benefit Analysis Software Conversion Study Cost Analysis Risk Management Plan Acquisition Planning Contract Solicitation Contract Selection Contract Award	Requirements Analysis Acquisition Risk Assessment and Risk I Plan Security Functional Requirer Analysis Security Operation Requirer Analysis Cost Considerations and Re Security Planning Security Control Developme Developmental Security Tes Evaluation Other Planning Components
Implementation Phase	Installation Inspection Acceptance Testing Initial User Training Documentation Contract Deliverable Acceptance	Inspection and Acceptance Security Control Integration Security Certification Security Accreditation
Operations/ Maintenance Phase	Performance measurement Contract modifications Operations Maintenance	Configuration Management Control Continuous Monitoring
	Appropriateness of Disposal	Information Preservation

Figure 5-1 Life Cycle Phases and other IT Security Elements

5.3 Additional System Development Life Cycle References

a. NIST SP 800-64, Security Considerations in the Information System Development Life Cycle.

b. NPR 7120.5, NASA Program and Project Management Process and Requirements.

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